

## Chapter 5. Key insights and avenues for further research

*Process quality, such as the quality of staff-child interactions, is the primary driver of children's development and learning through early childhood education and care (ECEC). However, it can be challenging to target the quality of such interactions with regulation. Research suggests that, apart from in-service training, changes in structural levers are not directly linked to child development and learning. It also suggests that staff should be well-trained, and enjoy good working conditions, such as favourable child-staff ratios, to be able to promote rich learning and well-being environments for children. Monitoring systems can also inform quality improvements. The report also shows that domains of process quality, such as child-to-child interactions, and domains of child development and learning, are overlooked in research. More and more fine-grained evidence on curriculum and monitoring would provide important insights. Contextual factors also merit further consideration, to examine the mechanisms at play between structure, process and child development. Finally, further studies of ECEC quality for the youngest are necessary to inform research and policy.*

## Introduction

Changing structural quality standards, and staff-child ratios and qualification requirements in particular, has been commonly used as a way of enhancing the quality of ECEC provision. Decisions of this kind are often made based on political debates rather than on evidence.

Recent research has suggested, furthermore, that process quality (e.g. staff-child interactions) matters more for better child development and learning than structural quality itself (e.g. staff-child ratios). Under the circumstances, policymakers are increasingly interested in gathering more evidence and unpacking the relationships between structural interventions and process quality that lead to better child development and learning. It is important to better understand the scope of process quality, identify the types of process quality that are amenable to policy interventions, and suggest options for affecting process quality through structural quality regulations.

This report is prepared as part of initial desk-based research for the new OECD ECEC project “Policy Review: on Quality beyond Regulations in ECEC”, and in particular, “process quality”. It reviews the existing evidence, which sets up some key insights based on available (but limited and narrowly defined) studies and highlights the most significant avenues for future research.

The evidence reported in previous chapters for the relationship between common structural quality indicators, and staff-child interactions<sup>1</sup> as well children’s development and learning is summarised in Table 5.1 and 5.2.

Table 5.1 summarises the findings from the literature review between structural traits and staff-child interactions in centres for children aged 3 to 5, 0 to 2, and family daycare settings, respectively.

Table 5.2 summarises the findings from the meta-analysis for centres for children aged 3 to 5, but not covering children aged 0 to 2. The table presents: i) associations between structural traits and staff-child interactions, ii) associations between structural traits and child development and learning, and iii) associations between staff-child interactions and child development and learning.

Both tables note the direction (i.e. negative, neutral, positive) of the associations found in the literature, as well as the scope of cited research, the strength of the evidence for this association, based on the number of studies that reported results for this element, and additional comments that can help interpret the association.

The scope and methods of the literature review and meta-analysis is limited (e.g. age coverage, coverage of ECEC provision types, coverage of countries, scope of process quality, scope of child development) and that additional research and a policy survey is thus needed to generate refined policy orientations. The research reviewed in this report draws heavily on observational, programme-based or national studies, while there are fewer experimental studies, studies at scale or of cross-national nature. The literature review and meta-analysis examined the association of variables, not a causal mechanism, and thus need to be interpreted with caution. With these caveat in mind, ten key insights are suggested by the summarised knowledge base.

In summary, the key insights include the following:

1. Lower child-staff ratios themselves alone will not guarantee better child development. But they are associated with more positive staff-child relations across all age groups.
2. Group sizes matter for staff-child interactions, but linkages are stronger for interactions with the youngest children than with children aged 3 to 5.
3. Relationships between quality indicators can be indirect, such as between ratios, group size, organisational climate, quality of staff-child interactions, and child development and learning.
4. Pre-service training, when focusing on ECEC content, is associated with better staff emotional, educational and developmental support for children, with a stronger relationship found in the case of the youngest children. However, the evidence on its association with child development and learning is inconclusive.
5. Licensing for family day care, when regulated with pre-service qualifications, can be a tool to ensure better interactions for children.
6. In-service training that includes ECEC-specific content relates to better staff-child interactions and child development and learning outcomes for all groups of children, especially in literacy skills.
7. Children's skills can develop more effectively when staff engage in quality developmental activities with children. Staff practices and engagement with children may depend on team collaboration, and benefit from improved working conditions and well-being.
8. Separate class- or playrooms for disadvantaged, immigrant or bilingual children are associated with risks for equity and quality in ECEC.
9. Monitoring systems, if they are used to inform quality improvements, are linked to greater support to children's development and learning in all ECEC settings.
10. The location of ECEC centres within schools is associated with differences in staff's relationships with children.

To complement the limitations of the existing research, the following eight areas are suggested for further research to address the “needs for improved or more research” and “needs for new research”:

1. Consider relationship of other structural features, such as funding and intensity of ECEC, to staff-child interactions and to child development.
2. Examine combined effects of different structural policy levers.
3. Explore “optimal” minimum quality standards and possible trade-offs.
4. Broaden the scope of child development and learning assessment to well-being as well as skills critical for future success, such as creative thinking.
5. Research other features of process quality such as children's experiences with their peers and the environment, as well as staff-staff interactions, the staff-parents interactions, and interactions with the community.
6. Better understand specific features and effects of the curriculum.
7. Investigate linkages between monitoring practices, staff-child relationships and child development further.
8. Expand evidence on process quality for infants and toddlers.

To build up the knowledge base in this area, the findings from this report will be used to frame questions for additional research and for a policy questionnaire, planned as the next steps of the OECD ECEC project “Policy Review: Quality beyond Regulations in ECEC”.

***Lower child-staff ratios themselves alone will not guarantee better child development. But they are associated with more positive staff-child relations across all age groups.***

Low child-staff ratios were found to enhance positive staff-child relationships across all types of settings and ECEC age groups. Multiple studies of individual countries including China, the US and Portugal, and a meta-analysis of 17 studies from Europe and North America suggest that a smaller number of children per ECEC staff tends to be associated with higher levels of process quality for centres catering to children aged 3 to 5 (Burchinal et al., 2002<sup>[103]</sup>; Hu et al., 2016a<sup>[104]</sup>; Mashburn et al., 2008<sup>[44]</sup>; Philips et al., 2000<sup>[100]</sup>; Phillipsen et al., 1997<sup>[101]</sup>; Vermeer et al., 2016<sup>[50]</sup>). While the association was not found everywhere, there is no evidence of any negative effects (Howes et al., 2008<sup>[34]</sup>; Mashburn et al., 2008<sup>[44]</sup>; Mashburn et al., 2009<sup>[109]</sup>; Montie, Xiang and Schweinhart, 2006<sup>[110]</sup>). Lower child-staff ratios were also associated with more positive interactions for children aged zero to 3 in the Flemish Community in Belgium, the Netherlands, in Portugal and the US (Barros and Aguiar, 2010<sup>[111]</sup>; Barros et al., 2016<sup>[39]</sup>; Deynoot-Schaub and Riksen-Walraven, 2005<sup>[112]</sup>; Hulpia et al., 2016<sup>[73]</sup>; Jamison et al., 2014<sup>[65]</sup>; Thomason and La Paro, 2009<sup>[38]</sup>; Phillipsen et al., 1997<sup>[101]</sup>). These findings were more conclusive for centre-based settings than for family daycare, where group sizes are usually much smaller.

***Group sizes matter for staff-child interactions, but linkages are stronger for interactions with the youngest children than with children aged 3 to 5.***

Some supporting evidence suggests that smaller group sizes improve staff-child interactions in settings for younger children (Barros and Aguiar, 2010<sup>[111]</sup>; Barros et al., 2016<sup>[39]</sup>; Deynoot-Schaub and Riksen-Walraven, 2005<sup>[112]</sup>; Hulpia et al., 2016<sup>[73]</sup>; Jamison et al., 2014<sup>[65]</sup>; Thomason and La Paro, 2009<sup>[38]</sup>; Phillipsen et al., 1997<sup>[101]</sup>). In looking at services for children aged 0 to 2, both group sizes and staff-child ratios were found to matter for the quality of staff-child interactions, even though a few studies did not find associations (Pessanha, Aguiar and Bairrão, 2007<sup>[113]</sup>; Vogel et al., 2015a<sup>[66]</sup>; Vogel et al., 2015b<sup>[67]</sup>). These findings were more conclusive for centre-based settings than for family daycare, where group sizes are usually much smaller. For the older age group, evidence can be found in both directions, which does not indicate that having smaller groups presents a clear benefit. No research on potential direct associations of group sizes with child development was available for this report.

***Relationships between quality indicators can be indirect, such as between ratios, group size, organisational climate, quality of staff-child interactions, and child development and learning.***

Despite some evidence from the United States showing an association between child-staff ratios and children’s pre-reading scores in preschool (Bigras, Lemay and Tremblay, 2012<sup>[198]</sup>; Cardon et al., 2008<sup>[199]</sup>; Howes, 1997<sup>[200]</sup>), there is no solid evidence of direct links to child development and learning across age groups. Tentative results suggest that those structure for processing relationships could be non- linear, i.e. that decreasing the

size of a small group may have effects that are different from reducing the size of a large group (Bowne et al., 2017<sub>[102]</sub>).

The review of the literature indicated a mixed pattern of associations across age groups and there was no relationship between low child-staff ratios and emerging academic skills, i.e. early literacy and early numeracy. There is, however, some preliminary evidence of indirect paths from ratios through staff-child interactions to children's development, but the associations are weak and need further confirmation (NICHD Early Child Care Research Network, 2002<sub>[62]</sub>).

In a couple of studies, the relationship between organisational climate and quality has been found to be even stronger than other classroom characteristics, such as the child-staff ratio (Biersteker et al., 2016<sub>[50]</sub>; Dennis and O'Connor, 2013<sub>[83]</sub>), as well as staff characteristics, including qualifications and work experience (Biersteker et al., 2016<sub>[50]</sub>). However, organisational climate itself is also associated with other centre characteristics (Ho, Lee and Teng, 2016<sub>[180]</sub>).

***Pre-service training, when focusing on ECEC content, is associated with better staff emotional, educational and developmental support for children, with a stronger relationship found in the case of the youngest children. However, the evidence on its association with child development and learning is inconclusive.***

Overall, higher pre-service qualifications were found to be related to better staff-child interactions in Germany, Denmark, Portugal, as well as in the United States (Barros and Leal, 2011<sub>[145]</sub>; Cryer et al., 1999<sub>[106]</sub>; Guo et al., 2010<sub>[146]</sub>; Pianta et al., 2005<sub>[31]</sub>; Slot et al., 2017b<sub>[63]</sub>). Across the entire ECEC age group, in home- and in centre-based settings, higher levels of pre-service training are associated with higher levels of staff's emotional, instructional and organisational interactions for staff, especially if the training includes content on ECEC (Burchinal et al., 2002<sub>[103]</sub>; Tout, Zaslow and Berry, 2006<sub>[147]</sub>). Pre-service training specifically enhances emotionally supportive interactions, and more educational and developmentally supportive interactions (Bauchmüller, Grötz and Rasmussen, 2014<sub>[150]</sub>; Howes et al., 2008<sub>[34]</sub>; Montie, Xiang and Schweinhart, 2006<sub>[110]</sub>; Sylva et al., 2004<sub>[13]</sub>).

the evidence has also shown a strong association between pre-service qualifications and staff-child interactions for children aged 0 to 2 in Quebec, the Flemish Community of Belgium, the Netherlands, Portugal and the US (Barros et al., 2016<sub>[39]</sub>; Bigras et al., 2010<sub>[139]</sub>; Castle et al., 2016<sub>[153]</sub>; Hulpia et al., 2016<sub>[73]</sub>; King et al., 2016<sub>[74]</sub>; Slot et al., 2015<sub>[40]</sub>; Thomason and La Paro, 2009<sub>[38]</sub>; Vogel et al., 2015a<sub>[66]</sub>; Vogel et al., 2015b<sub>[67]</sub>).

However, according to evidence on 3-5 year-old children the direct link between pre-service qualifications and child learning and development is weak or unclear (von Suchodoletz et al., 2017<sub>[17]</sub>). Higher staff qualifications were not associated with emerging academic skills, or behavioural/social skills (Early et al., 2006<sub>[149]</sub>; Mashburn et al., 2008<sub>[44]</sub>).

***Licensing for family day care, when regulated with pre-service qualifications, can be a tool to ensure diverse learning experiences for children.***

The limited available evidence on family daycare suggests that licensed providers for the youngest children with higher pre-service qualifications provide more diverse learning experiences and activities, and also demonstrate more active involvement and guidance in

these activities than less educated family daycare providers in the United States (Colwell et al., 2013<sup>[116]</sup>; Doherty et al., 2006<sup>[132]</sup>; Raikes, Raikes and Wilcox, 2005<sup>[155]</sup>; Schaack, Le and Setodji, 2017<sup>[156]</sup>) and Flemish Belgium (Hulpia et al., 2016<sup>[73]</sup>; Vandenbroeck et al., 2018<sup>[29]</sup>).

However, there is no evidence for direct links between pre-service training of family daycare providers and child development.

***In-service training that includes ECEC-specific content relates to better staff-child interactions and child development and learning outcomes for all groups of children, especially in literacy skills.***

Consistent positive associations for all settings and age groups examined were found between staff in-service training (or professional development) and the interactions staff have with children in diverse geographic locations, including Denmark, Portugal, China and the US (Fukkink and Lont, 2007<sup>[157]</sup>; Hamre et al., 2012<sup>[158]</sup>; Justice et al., 2008<sup>[124]</sup>; LoCassale-Crouch et al., 2011<sup>[159]</sup>; Slot et al., 2017b<sup>[63]</sup>; Slot, Lerkkanen and Leseman, 2015<sup>[99]</sup>; Zaslow et al., 2010<sup>[160]</sup>), especially if the training included ECEC content for instance related to staff-child interactions (Siraj-Blatchford et al., 2005<sup>[163]</sup>; Zaslow et al., 2004<sup>[164]</sup>). Staff participating in in-service training have consistently been found to score higher on language and literacy-specific quality (Egert, 2015<sup>[161]</sup>), whereas evidence on the links to overall quality in ECEC or staff-child interactions is mixed.

There is also a consistent evidence base across all age groups for a positive link between in-service training and children's development and learning, with the evidence particularly strong for children's language and literacy skills (Egert, 2015<sup>[161]</sup>; Jensen and Rasmussen, 2015<sup>[166]</sup>; Markussen-Brown et al., 2017<sup>[162]</sup>). The number of studies available for settings for children aged zero to 3 was more limited, but the pattern of results is largely consistent (Burchinal, Howes and Kontos, 2002<sup>[76]</sup>; Hallam, Bargreen and Ridgley, 2013<sup>[167]</sup>).

***Children's skills can develop more effectively when staff engage in quality developmental activities with children. Staff practices and engagement with children may depend on team collaboration, and benefit from improved working conditions and well-being.***

Children in ECEC centres with better staff-child interactions, or staff who provide higher quality or more exposure to developmental and educational activities, were found to have higher levels of emerging literacy and numeracy skills, as well as better behavioural and social skills (von Suchodoletz et al., 2017<sup>[17]</sup>).

Positive associations were found between staff-child interactions, including higher-quality educational and developmental activities, with staff well-being (Jennings, 2015<sup>[174]</sup>), salaries (Cryer et al., 1999<sup>[106]</sup>; Hu et al., 2016a<sup>[104]</sup>; Pianta et al., 2005<sup>[31]</sup>) and with centre organisational climate (Ho, Lee and Teng, 2016<sup>[180]</sup>). Higher-quality organisational climate includes those where staff believed that they enjoyed more autonomy and support for showing leadership, exchanged their visions with colleagues more often, and reported more opportunities for participating in decision-making in aspects of the curriculum (Ho, Lee and Teng, 2016<sup>[180]</sup>).

While the number of studies that have included these structural aspects is somewhat limited and research does not find evidence for effects of staff work experience (von Suchodoletz et al., 2017<sup>[17]</sup>), emerging evidence indicates that centres where staff reported

higher well-being (including job satisfaction and lack of depressive symptoms), higher salaries and more team collaboration show better staff-child interactions across all age groups (Biersteker et al., 2016<sup>[154]</sup>; Bloom and Bella, 2005<sup>[176]</sup>; Bloom and Sheerer, 1992<sup>[177]</sup>; Cassidy et al., 2017<sup>[175]</sup>; Hu et al., 2016a<sup>[104]</sup>; Jennings, 2015<sup>[174]</sup>; Pessanha, Aguiar and Bairrão, 2007<sup>[113]</sup>; Sylva et al., 2004<sup>[13]</sup>; Vogel et al., 2015a<sup>[66]</sup>).

The ECEC sector, especially for the youngest children, suffers from staff shortages, high rates of turnover and low status in many countries (Moon and Burbank, 2004<sup>[136]</sup>). When staff members regularly change within a group of children, staff and children are less able to develop stable relationships and the frequency of nurturing, stimulating interactions is reduced (CCL, 2006<sup>[201]</sup>). Political concerns about the quality of interactions thus support the case for raising working conditions – in the best interests of the children’s experience and the staff’s job satisfaction.

The research conducted for this report did not examine links between working conditions and child development because research on those associations is neither very extensive nor conclusive. There is a complex interrelationship between child-staff ratios, staff qualifications, quality and types of settings. For instance, ratios relate to working conditions for staff and to learning and well-being environments for children. This makes it difficult to single out the effect of a particular characteristic of working conditions on process quality (Sammons, 2010<sup>[202]</sup>).

***Separate class- or playrooms for disadvantaged, immigrant or bilingual children are associated with risks for equity and quality in ECEC.***

Targeting ECEC provision for disadvantaged groups may seem a cost-effective way to ensure that services reach those who need them most, but concerns about quality need to be considered. The present study finds that in play or classrooms in Denmark (Slot et al., 2017b<sup>[63]</sup>), Germany (Kuger et al., 2015<sup>[120]</sup>; Leu and Schelle, 2009<sup>[27]</sup>; Lehl, Kuger and Anders, 2014<sup>[121]</sup>; Slot, Lerkkanen and Leseman, 2015<sup>[99]</sup>), and the United States (LoCassale-Crouch et al., 2007<sup>[122]</sup>; Tonyan and Howes, 2003<sup>[123]</sup>), the quality of staff-child interactions was lower in those that had a high percentage of immigrant or bilingual children than in play- or classrooms with a more balanced or mixed group composition.

Classrooms with a high percentage of immigrant or bilingual children are also associated with lower scores in children’s language and literacy skills (Ebert et al., 2013<sup>[108]</sup>; de Haan et al., 2013<sup>[130]</sup>; Schnechter and Bye, 2007<sup>[203]</sup>). The evidence is more consistent for children aged 3 to 5 than for centres with younger children (Hulpia et al., 2016<sup>[73]</sup>; Slot et al., 2017a<sup>[36]</sup>), which may be related to the targeted high-quality provision for the youngest children in some countries. Negative relations between the percentage of immigrant or bilingual children and the quality of staff-child interactions were also observed in family daycare (Hulpia et al., 2016<sup>[73]</sup>).

Some preliminary evidence demonstrates that observed lower levels of staff emotional support and classroom organisation may be the key to this relationship (Slot et al., 2017b<sup>[63]</sup>). The associations between staff-child interactions and children’s development and learning, however, do not seem to differ significantly for children from predominantly disadvantaged backgrounds compared to a mixed group of children.

***Monitoring systems, if they are used to inform quality improvements, are linked to greater support to children’s development and learning in all ECEC settings.***

Quality rating and improvement systems (QRIS) are found to be associated with higher levels of staff-child interactions in centres for all age groups in the United States (Jeon, Buettner and Hur, 2014<sup>[189]</sup>), while the linkage between QRIS and staff-child interactions in family daycare is less clear (Lahti et al., 2015<sup>[70]</sup>; Lipscomb et al., 2017<sup>[193]</sup>). Where evidence exists, there is an indication that positive feedback loops between monitoring systems and staff practices may be associated with gains in children’s language development (OECD, 2015<sup>[5]</sup>). A key target of policy efforts might thus be to ensure that information on staff-child interactions in centres is collected not simply for purposes of accountability, but used to inform quality improvements.

***The location of ECEC centres within schools is associated with differences in staff’s relationships with children.***

The physical location of a preschool may also be related to process quality in Finland, the US and Portugal. Higher quality staff-children relationships were observed in preschools located in schools, by comparison with preschools situated outside the school grounds or in independently functioning centres (Pianta et al., 2005<sup>[31]</sup>; Slot, 2017<sup>[16]</sup>; Slot, Lerkkanen and Leseman, 2015<sup>[99]</sup>). There is also evidence that staff working in classrooms located in schools had higher education levels, were paid more, and showed a stronger educational orientation than staff working in independent centres (Clifford et al., 2005<sup>[118]</sup>; Pianta et al., 2005<sup>[31]</sup>).

Although the number of studies is limited, the evidence for this mechanism appears consistent and from multiple countries. However, no direct linkages to children’s development were identified.

## **Avenues for further research 1: clarifying inconclusive evidence**

To improve the existing knowledge base, the following areas are identified where the evidence is lacking or inconclusive or new methodologies are needed to enhance the quality of research.

***Consider relationship of other structural features, such as funding and intensity of ECEC, to staff-child interactions and to child development***

Effects of ECEC funding and intensity of ECEC services have attracted considerable political attention across OECD countries. Both topics were included in the study, but possibly also due to the very few studies available, the literature review and meta-analysis led to less consistent results. Funding of ECEC provisions was associated with the quality of the relationships in centres in many cases, but associations varied across countries and were less clear for centres for children aged 0 to 2.

The intensity of daily service was not consistently related to the quality of staff-child interactions. The association varied within and across countries, and depended on how the interactions between staff and children were observed and documented in the full-day and half-day class- or playroom (e.g. a global score of staff-child interactions rather than a combined score of staff emotional, instructional, and organisational interactions).

Political debate is often particularly heated as to whether to increase ECEC funding or extend free hours of ECEC provision from half-day to full-day. Such considerations often

aim to support children's development and learning, especially for children of disadvantaged backgrounds, but sound evidence is required to make informed decisions. Investigating the relationships of funding and of the intensity of ECEC services to children is a high priority for the evidence base.

More research is needed to unpack the relationship between structural mechanisms and child outcomes, namely examining how structural characteristics may be *indirectly* related to child development and learning, and may influence child development through process quality. The evidence from this new approach has so far only scrutinised child-staff ratios, staff qualifications and group, class- or playroom composition, but in such cases, it has proven useful. For example, in one US study, teacher education at higher level was found to influence children's vocabulary skills only indirectly and through the staff's warmth and responsiveness, but not directly (Connor et al., 2005<sub>[61]</sub>). In this case, emotional support but not instructional support (both domains of staff-child relationships), was the facilitator of development. It is thus worth further exploration whether investing in pre-service training that focus on promoting emotional support (or matching it with professional development in this area) is the most promising strategy for influencing development.

### ***Examine combined effects of different structural policy levers***

To understand how different structural features may jointly influence process quality, it is important to examine more studies of individual levers (e.g. ratios) and to look at models of policy implementation. In designing policy, decisions are seldom taken in isolation, or made regardless of other structural conditions. Policy decisions are commonly made in tandem for several indicators, for instance through a broader reform, or in relationship with a previous policy that has already been established or implemented.

This approach has been applied to only a limited number of structural indicators. For example, the evidence on the associations between type of funding and process quality appears largely inconclusive. In countries such as China, Portugal and the US, the literature demonstrates that public centres for children between 3 and 5 seem to provide higher process quality than private settings, whereas for example, in Spain, no significant differences were found between public or private preschools. Moreover, for children aged 0 to 2, there was no clear pattern in the limited evidence available.

However, when funding features were examined in tandem with other structural features in the same countries, such as staff education or monitoring provisions, a pattern of compensating factors emerged. For instance, in the United States, staff working in the public sector were on average better educated than staff in private settings (Coley et al., 2016<sub>[77]</sub>; Fuligni et al., 2009<sub>[79]</sub>). In China, staff in public settings tended to be more highly educated and earned higher salaries (Hu et al., 2016a<sub>[104]</sub>). In Portugal, quality was higher in classrooms with higher, unfavourable child-staff ratios, and lower with more favourable ratios, but only in the public sector (Slot, Lerkkanen and Leseman, 2015<sub>[99]</sub>). For the private sector, no differences in process quality were found to be related to ratios.

The available evidence looking at these approaches has so far been limited to a small number of levers and studies.

### ***Explore “optimal” minimum quality standards and possible trade-offs***

To maximise investment, the research should endeavour to identify optimal levels and examine trade-offs in structural quality. Preliminary evidence suggests that some of the

most commonly used structural levers, such as ratios and group size, may not act in a one-to-one relationship with process quality. A recent meta-analysis examining a large number of US ECEC programme evaluation studies for centres for 3- to 6-year-olds demonstrated that ECEC structural conditions for maximum child development and learning improved as ratios and groups sizes approached an optimum of 7.5 children to 1 adult and a maximum group size of 15 children, and then decreased (Bowne et al., 2017<sup>[102]</sup>). Further investment in reducing ratios and group sizes would be wasteful, if not counterproductive. Other indicators may work in similar ways.

In other cases, the central concern is more of a trade-off, such as in the case of the intensity of ECEC service. Affordable, full-time ECEC is a key facilitating factor for young parents' participation in the labour force, but it is important to consider its potential risks and benefits for children. The research reviewed for this report does not provide a conclusive picture of whether or not longer hours in ECEC, i.e. greater intensity, are associated with interactions of higher quality. Sustaining high levels of quality for longer hours can also involve considerable cost.

### **Avenues for further research 2: create new evidence where gaps exist or where research hypotheses are not applicable**

In comparison to the Starting Strong III Quality Toolbox, two policy levers – curriculum and pedagogy, and parent and community engagement – were not included in this report. Curriculum and pedagogy were found to be rarely and inconsistently addressed in the empirical literature. Parent and guardian engagement was considered beyond the scope of the literature review and meta-analysis due to the lack of research.

#### ***Broaden the scope of child development and learning assessment to well-being as well as skills critical for future success, such as creative thinking***

Examination of child development and learning outcomes in connection with structural and process investments in quality is often limited to areas of content-specific learning, such as emergent literacy or mathematics. A disproportionate amount of evidence is available on pre-academic skills, which reduces the possibility of obtaining a global understanding of the potential effects of policies for ECEC quality on child development.

There is a trend towards more examination of social and behavioural skills, but the skills are also defined in the scope of group, class or playroom processes or “school-related” activities (Howes et al., 2008<sup>[34]</sup>). Behavioural skills, for example, may be observed only as an ability to behave in the context of a classroom, overlooking the children's capacity to collaborate within peer-to-peer relationships.

Children's well-being is seldom examined, and other critical skills are often overlooked, such as the ability to reason logically, think creatively, inquire and explore based on inherent curiosity. In these domains, the challenge lies in developing valid and reliable tools so information can be collected systematically to inform policy.

#### ***Research other features of process quality such as children's experiences with their peers and the environment, as well as staff-staff interactions, the staff-parents interactions, and interactions with the community***

Process quality is narrowly understood in the literature, and this report thus focuses only on the quality of staff-child interactions and activities. Of all 44 studies coded in the

meta-analysis, all but 7 operationalised process quality as staff-child interactions (von Suchodoletz et al., 2017<sub>[17]</sub>). There is some growing evidence in the literature that more specific measures of quality are better predictors of child outcomes (Burchinal, 2016<sub>[7]</sub>). However, often process quality subdomains were aggregated into a single indicator to increase scientific rigour, which in turn limits more fine-grained analysis and potential relationships with subdomains of child development and learning.

Facilitation of peer interactions was considered a priority for coding in the meta-analysis, but studies of peer interactions as an indicator of process quality were scarce, and often limited to studies conducted in the United States (von Suchodoletz et al., 2017<sub>[17]</sub>). Even within classroom interactions, the majority of observational measures largely ignore peer relationships (Slot et al., 2016<sub>[204]</sub>). A closer look at peer interactions could for instance contribute to a better understanding of the mixed findings on the associations between group size and process quality for children aged 3 to 5, indicating that “smaller” may not always be “better”.

Other important areas such as staff-to-staff interactions, and staff (or child)-to-parents and -community interactions could not be considered, even though they may have crucial links with child development and learning. Aspects of the interactions between staff and the family or community are of paramount importance, particularly for examining the quality of ECEC provided to children and families of diverse backgrounds (e.g. multicultural, economically disadvantaged and religious), or dual/second-language learners. However, these aspects were considered beyond the scope of the research examined in this report.

This is in line with the fact that this report lacks an area of investigation in ‘engaging families and communities, one of the key policy levers for enhancing quality in ECEC from *Starting Strong III* (OECD, 2011<sub>[4]</sub>).

### ***Better understand specific features and effects of the curriculum***

Although a literature review on curriculum and pedagogy was considered a priority for this report, the research summarised was found to be too limited and imprecise to merit inclusion in the report. Overall, only very few studies had investigated the relation between curriculum and pedagogy and process quality. The terms curriculum and pedagogy were used interchangeably in much of the research reviewed (Slot, 2016<sub>[205]</sub>), blurring the distinction between the two and their respective association with process quality. For example, studies may refer to the effects of content-specific activities without specifying whether they are in fact prescribed by the curriculum.

Research tend to create artificial separations between holistic, play-based and skills-based curricula, even though play and supporting the development of specific skills are not mutually exclusive, as shown in the *Starting Strong III* report (OECD, 2011<sub>[4]</sub>). Such false dichotomies are reflected in the fact that there is little and only mixed evidence indicating to what extent approaches explicitly framed as “play-based” or “holistic” contribute to children’s development across various domains. An emerging body of research has started to explore the effects of differentiated pedagogies, whether “play-based”, “free play”, “structured play”, etc.

At the same time, is more evidence is available on the effects of so-called skill-specific curricula and activities on skills targeted by the specific curricula. This is partly due to a strong focus on observation of pre-academic activities. In the meta-analysis, despite the variety of measures used to examine process quality, all the studies focused on

educational activities, i.e. early literacy or early numeracy. Fewer measures are available to observe interactions in unstructured environments, or focus on the quality of group play or play in the context of a class or playroom.

A more nuanced approach to curriculum is needed to better understand the effects of differences in content, pedagogy and measures that help support implementation (e.g. in-service training and monitoring). Results may, for instance, be distorted by the availability – or lack thereof – of professional development to empower staff in their work with the curriculum. More research is also needed on what constitutes an effective curriculum and how to implement it, which is part of the planned next step of the OECD ECEC Policy Review for *Starting Strong VI*.

***Investigate linkages between monitoring practices, staff-child relationships and child development further.***

Despite the diversity of monitoring tools implemented by countries, the only feature of data and monitoring systems examined in the literature is the use of Quality Rating Improvement Systems or QRIS. This evidence was limited to a small number of countries (i.e. US, Australia and China). In fact, no other associations between indicators of monitoring and process quality were reported in the literature review.

Moreover, the literature review also noted that monitoring and rating systems provided only rough indicators of quality; i.e. the QRIS seemed to be most accurate in distinguishing between low levels and high levels of quality, rather than being useful for making fine-grained quality assessments (Slot, 2017<sup>[16]</sup>). Further examination is needed to develop monitoring systems, in close alignment with other more valid and reliable indicators of process quality.

Finally, it is important to consider that much of the research summarised on quality monitoring systems relies on (US) state-level QRIS systems that are voluntary. The self-selection of relatively higher-quality centres in these studies may make the conclusions less informative for other states or countries hoping to implement universal QRIS systems. More cross-national research of different policy options is needed to inform countries how to implement monitoring practices linked to staff-child relationships, and facilitate child development.

***Expand evidence on process quality for infants and toddlers***

Overall, studies on process quality features of early education and care for infants and toddlers are less numerous than on education and care for children aged 3 to 5, or are limited to only a few countries for each mechanism. For instance, aspects of the physical location of schools and links to staff-child interactions have mostly been explored in studies from Portugal, and issues of intensity of daily service mostly in the Netherlands for this age group. The limited availability of relevant studies for some levers prevented a systematic comparison of mechanisms across different types of ECEC provision.

In family daycare settings, large gaps are observed. For example, aspects of governance and standards seem to be under-researched for family daycare and are thus far limited to licensing and regulations.

**Table 5.1. A summary of findings from the literature review of the relationship between structural characteristics and staff-child interactions**

Results are presented by policy lever, age range and type of provision

	3 to 5 years old					0 to 2 years old					Family daycare				
Quality aspects	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
Standards and governance (Chapter 2)															
Child-staff ratio	X	X		12 studies across the world, including 2 cross-national comparison studies and 1 meta-analysis	Mostly consistent evidence towards smaller ratios (also based on the meta-analysis); only 3 studies showed null associations	X	x		13 studies across the world (5 US)	The majority of studies (10 out of 12) showed a significant negative relationship between ratio and process quality (3 studies in the Netherlands; 2 studies in Portugal, Canada and Flemish Comm. [Belgium])	x	x		2 US studies, 1 Canada-Quebec and 1 Flemish study	Canadian and Flemish showed a negative relationship, whereas the US studies reported null associations

Quality aspects	3 to 5 years old					0 to 2 years old					Family daycare				
	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
<b>Group size</b>	X	X	x	12 studies across the world, including 1 cross-national comparison study and 1 meta-analysis	Mostly consistent evidence in the case of smaller groups; 2 studies showed null associations (including the meta-analysis) and only 1 study indicated negative associations	X	x		13 studies across the world, including 1 cross-country comparison study (5 US)	The majority of studies (8 out of 13) showed a negative association between group size and process quality (3 studies in the Netherlands and 2x in Portugal and Flemish Comm. [Belgium])	x	x		1 US study, 1 Flemish study	The Flemish study showed a negative relationship with overall environmental quality, but no associations with quality of interactions
<b>Type is public or non-profit</b>		X	X	4 studies	Positive relations in China, Portugal and the US, but no differences between public and private in Spain		x	x	1 US study and 1 Portuguese study	The US study showed higher quality in not-for-profit settings, but the Portuguese study showed no differences					
<b>Rural</b>	X			1 US study and 1 study from China	Less availability of ECEC in rural areas and lower quality in China			x	1 Portuguese study						
<b>Located in school</b>			x	1 study from the US and 1 study from Finland											

Quality aspects	3 to 5 years old					0 to 2 years old					Family daycare				
	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
Licensing or affiliation to professional organisation								x	1 US study			x	x	1 US, 1 Canadian, and 1 Flemish study	A positive association between (intention to apply for) licensing and staff-child interactions, but no difference between affiliated and non-affiliated providers in Flemish Comm. (Belgium)
Networking											x			1 Canadian study	Positive relation of informal networking and staff-child interactions
Mean age of children		X	x	1 US study and 1 study from Germany	No relations in US and positive relations in Germany										
% immigrant or multilingual children	X	X		4 studies from Germany, 2 US studies and 1 study from Denmark	Mostly consistent evidence that a higher share of immigrant children is related to lower quality, except for null associations in 1 US study	x		x	2 studies	1 Dutch study and 1 Flemish study showing opposite results	x			1 Flemish study	Negative relationship with overall environmental quality

	3 to 5 years old					0 to 2 years old					Family daycare				
Quality aspects	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
Workforce development and working conditions (Chapter 3)															
Pre-service qualifications		x	X	12 studies across Europe and the US	The majority of studies indicated positive effects (9 out of 12)		x	X	12 studies across the world (6 US), including 1 meta-analysis across countries	The majority of studies (10 out of 11) including the meta-analysis showed positive relations between staff qualifications and process quality (Canada-Quebec, Flemish Comm. [Belgium], Portugal, the Netherlands)		x	X	5 US studies, 1 Canada-Quebec and 1 Flemish Comm. [Belgium]study	The Flemish study showed a positive relation with overall environmental quality, but not with the quality of interactions; 2 US studies showed null associations with pre-service education, but rather with additional in-service training
In-service training (professional development)			X	11 studies across Europe, China and the US, including 3 meta-analyses	Overall, positive relations between in-service training and quality, but inconsistencies within studies, depending on type and amount of in-service training			X	3 studies (1 US), including 1 meta-analysis				X	4 US studies, 1 Flemish Comm. [Belgium]study, 1 Dutch study and 1 international meta-analysis	In-service training positively related to staff-child interactions. However, in the Flemish study, the positive relationship obtained only for infant care and not for toddler care

Quality aspects	3 to 5 years old					0 to 2 years old					Family daycare				
	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
Well-being		x	x	1 US study and 1 study from Finland				x	2 US studies	Positive associations between broad measures of staff well-being and process quality were shown in 2 studies					
Years of experience	x	X	x	10 studies across the world, including cross-national comparisons	A positive relationship was shown in 2 studies (1 US, 1 Germany); 4 studies (3 US, 1 China) reported null associations, and 2 US revealed negative relations; 2 cross-national studies showed mixed findings		x	X	10 studies across the world (6 US)	A positive relationship was shown in 6 studies (5 US, 1 Netherlands) and 4 studies reported null associations (2x in Portugal and 2x in US)	x	x		2 US studies, 1 Flemish Comm. [Belgium]study	US studies showed no relationship and Flemish study showed a negative relationship for infant care and null associations for toddler care
Working conditions, e.g. salaries		x	x	1 US study and 1 study from China	Positive effects of salary in China, but not in the US			x	1 Portuguese study						
Leadership or management quality			x	1 study from South Africa				x	1 study from South Africa						

Quality aspects	3 to 5 years old					0 to 2 years old					Family daycare				
	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments	Associations with staff-child interactions			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
Organisational climate			X	3 US studies and 1 study from England (United Kingdom)											
Data and Monitoring (Chapter 4)															
Quality rating improvement systems (QRIS)			X	6 US studies, 2 studies from China and 1 study from Australia	Despite consistent positive relations, QRIS mainly distinguish rough indicators of low as opposed to high quality and show less consistent evidence in more fine-grained comparisons	x	x		3 US small-scale studies	Moderate associations were shown in 2 studies between QRIS rating and process quality; 1 study failed to show correlations, but distinguished between lower and higher quality			X	3 US studies	Participation and star rating related to better staff-child interactions

*Note:* (-) indicates a negative association, (0) indicates null associations and (+) indicates positive associations. A capital (X) indicates stronger evidence and a small (x) indicates weaker evidence.

*Source:* (Slot, 2017<sub>[16]</sub>)

**Table 5.2. A summary of findings from the meta-analysis of the relationship between structural characteristics, staff-child interactions, and child development and learning for centres for children aged 3 to 5**

Results are presented by policy theme

Quality aspects	Associations of structural quality with staff-child interactions			Associations of structural quality with child development and learning			Associations of staff-child interactions with child development and learning		
	Direction and size of effect		Scope of research	Comments	Direction and size of effect		Scope of research	Comments	Comments
	-	0	+		-	0	+		
<b>Quality standards and governance (Chapter 2)</b>									
<b>Child- (lead) staff ratio</b>	x	X	7 studies across the world	Mostly consistent and significantly negative associations between ratios and process quality; meta-analysis indicated no geographical differences (US vs. non-US)	x		3 US studies	Null association between child-staff ratio and emerging academic skills (i.e. early literacy and early numeracy) was not significant and close to zero.	

	Associations of structural quality with staff-child interactions					Associations of structural quality with child development and learning					Associations of staff-child interactions with child development and learning				
Quality aspects	Direction and size of effect			Scope of research	Comments	Direction and size of effect			Scope of research	Comments	Direction and size of effect			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
Length of daily service is full day (rather than half-day)	x		x	2 US studies and 2 studies from Australia	Results were inconsistent across countries and across measures of process quality (overall score or staff-child interaction composite).										
Workforce development and working conditions (Chapter 3)															
Pre-service qualifications		x	X	6 studies (1 Netherlands, 5 US) for staff-child interactions, and 3 US studies for developmental and educational activities	A positive and significant association with staff-child interactions, and no association with provision of activities.		x		3 US studies for each association tested	Null association between staff pre-service qualifications and emerging academic skills; null staff education between pre-service qualifications and behavioural/social skills.					
Developmental and educational activities (process indicator)												x		6 studies for children's emerging academic skills and 3 studies for children's behavioural/social skills	Positive (weak) associations between quality of / exposure to developmental and educational activities and children's emerging academic skills, as well as behavioural/social skills.

	Associations of structural quality with staff-child interactions						Associations of structural quality with child development and learning						Associations of staff-child interactions with child development and learning					
Quality aspects	Direction and size of effect			Scope of research	Comments	Direction and size of effect			Scope of research	Comments	Direction and size of effect			Scope of research	Comments			
	-	0	+			-	0	+			-	0	+					
Staff-child interactions (e.g. global staff-child interaction scores; combined staff-child interaction scores) (process indicator)											x		X	10 studies (2 from Germany, 1 from Portugal, 7 from US) using global staff-child interaction scores; 8 studies (1 from Australia, 7 from US) using combined staff-child interaction scores	Consistent positive association between positive staff-child interactions and children's literacy and numeracy learning. No differences were noted for studies with children from disadvantaged backgrounds compared to studies with a diverse sample.			
Staff-child interactions (e.g. global staff-child interaction scores; combined staff-child interaction scores) (process indicator)											x	x	x	9 studies (1 from Finland, 2 from Portugal, 1 from Germany, 5 from US) using global staff-child interaction scores; 8 studies (1 from Flemish Comm. [Belgium], 1 from Portugal, 1 from Tanzania, 5 from the US) using combined staff-child interaction scores	Null associations between positive staff-child interactions and children's behavioural/ social skills. No differences were noted for studies with children from disadvantaged backgrounds compared to studies with a diverse sample. Geographical differences in these results: US studies showed a negative association between staff-child interactions and children's behavioural skills; but an overall positive was found in studies conducted outside the United States			

	Associations of structural quality with staff-child interactions					Associations of structural quality with child development and learning					Associations of staff-child interactions with child development and learning				
Quality aspects	Direction and size of effect			Scope of research	Comments	Direction and size of effect			Scope of research	Comments	Direction and size of effect			Scope of research	Comments
	-	0	+			-	0	+			-	0	+		
Negative staff-child interactions (process indicator)											X			4 studies (1 from Flemish Comm. [Belgium], 1 from Tanzania, and 2 from the US)	Significant negative association, suggesting that negative staff-child interactions are associated with less positive behavioural/ social skills of children

Source: (von Suchodoletz et al., 2017<sub>[17]</sub>).

## Note

1. Staff-child interactions will include “staff emotional, instructional, and organisation interactions with the children”, and “implementation of developmental and educational activities”.

## References

- Barros, S. and C. Aguiar (2010), “Assessing the quality of Portuguese child care programs for toddlers”, *Early Childhood Research Quarterly*, Vol. 25/4, pp. 527-535, <http://dx.doi.org/10.1016/j.ecresq.2009.12.003>. [10]
- Barros, S. and T. Leal (2011), “Dimensões da qualidade das salas de creche do distrito do Porto (Quality dimensions of day care classrooms in the district of Porto)”, *Revista Galego-Portuguesa de Psicoloxía e Educación*, Vol. 9/2, pp. 117-132. [25]
- Barros, S. et al. (2016), “Infant child care in Portugal: Associations with structural characteristics”, *Early Childhood Research Quarterly*, Vol. 37/1, pp. 118-130, <http://dx.doi.org/10.1016/j.ecresq.2016.05.003>. [11]
- Bauchmüller, R., M. Grøtz and A. Rasmussen (2014), “Long-run benefits from universal high-quality preschooling”, *Early Childhood Research Quarterly*, Vol. 29/4, pp. 457-470, <http://dx.doi.org/10.1016/j.ecresq.2014.05.009>. [31]
- Biersteker, L. et al. (2016), “Center-based early childhood care and education program quality: A South- African study”, *Early Childhood Research Quarterly*, Vol. 36, pp. 334-344, <http://dx.doi.org/10.1016/j.ecresq.2016.01.004>. [58]
- Bigras, N. et al. (2010), “A comparative study of structural and process quality in center-based and family-based child care services”, *Child Youth Care Forum*, Vol. 39/3, pp. 129-150, <http://dx.doi.org/10.1007/s10566-009-9088-4>. [33]
- Bigras, N., L. Lemay and M. Tremblay (2012), *Petite enfance, services de garde éducatifs et développement des enfants : état des connaissances.*, Presses de l'Université du Québec, Montréal. [19]
- Bloom, P. and M. Sheerer (1992), “The effect of leadership training on child care program quality”, *Early Childhood Research Quarterly*, Vol. 7/4, pp. 579-594, [http://dx.doi.org/10.1016/0885-2006\(92\)90112-C](http://dx.doi.org/10.1016/0885-2006(92)90112-C). [60]
- Bloom, P. and J. Bella (2005), “Investment in leadership training: The payoff for early childhood education”, *YC Young Children*, Vol. 60/1, <http://newhorizonsbooks.net/wp-content/uploads/2015/06/Investment-in-Leadership-Training-The-Payoff-for-ECE.pdf>, pp. 32-40. [59]

- Bowne, J. et al. (2017), “A meta-analysis of class size and ratios in early childhood programs: Are thresholds of quality associated with greater impacts on cognitive, achievement, and socioemotional outcomes?”, *Educational Evaluation and Policy Analysis*, advanced online publication, <http://dx.doi.org/10.3102/0162373716689489>. [22]
- Burchinal, E. (2016), “Quality, thresholds, features and dosage in early care and education: Secondary data analyses of child outcomes”, *Monographs of the Society for Research in Child Development*, Vol. 81/2, <http://dx.doi.org/10.1111/mono.12248>. [83]
- Burchinal, M. et al. (2002), “Caregiver training and classroom quality in child care centers”, *Applied Developmental Science*, Vol. 6/1, pp. 2-11, [http://dx.doi.org/10.1207/S1532480XADS0601\\_01](http://dx.doi.org/10.1207/S1532480XADS0601_01). [1]
- Burchinal, M., C. Howes and S. Kontos (2002), “Structural predictors of child care quality in child care homes”, *Early Childhood Research Quarterly*, Vol. 17/1, pp. 87-105, [http://dx.doi.org/10.1016/S0885-2006\(02\)00132-1](http://dx.doi.org/10.1016/S0885-2006(02)00132-1). [55]
- Cardon, G. et al. (2008), “The contribution of preschool playground factors in explaining children's physical activity during recess”, *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 5/1, p. 11, <http://dx.doi.org/10.1186/1479-5868-5-11>. [20]
- Cassidy, D. et al. (2017), “Teacher work environments are toddler learning environments: Teacher professional well-being, classroom emotional support, and toddlers' emotional expressions and behaviors”, *Early Child Development and Care*, Vol. 187/11, pp. 1666-1678, <http://dx.doi.org/10.1080/03004430.2016.1180516>. [61]
- Castle, S. et al. (2016), “Teacher-child interactions in early Head Start classrooms: Associations with teacher characteristics”, *Early Education and Development*, Vol. 27/2, pp. 259-274, <http://dx.doi.org/10.1080/10409289.2016.1102017>. [34]
- Canadian Council on Learning (CCL) (ed.) (2006), *Why is High-Quality Child Care Essential? The Link between Quality Child Care and Early Learning*, Lessons in Learning, CCL, Ottawa. [63]
- Clifford, R. et al. (2005), “What is pre-kindergarten? Characteristics of public pre-kindergarten programs”, *Applied Developmental Science*, Vol. 9/3, pp. 126-143, [http://dx.doi.org/10.1207/s1532480xads0903\\_1](http://dx.doi.org/10.1207/s1532480xads0903_1). [79]
- Coley, R. et al. (2016), “Comparing public, private, and informal preschool programs in a national sample of low-income children”, *Early Childhood Research Quarterly*, Vol. 36, pp. 91-105, <http://dx.doi.org/10.1016/j.ecresq.2015.11.002>. [81]
- Colwell, N. et al. (2013), “New evidence on the validity of the Arnett Caregiver Interaction Scale: Results from the early childhood longitudinal study-birth cohort”, *Early Childhood Research Quarterly*, Vol. 28/2, pp. 218-233, <http://dx.doi.org/10.1016/j.ecresq.2012.12.004>. [39]
- Connor, C. et al. (2005), “Teacher qualifications, classroom practices, family characteristics, and preschool experience: Complex effects on first graders' vocabulary and early reading outcomes”, *Journal of School Psychology*, Vol. 43/4, pp. 343-375, <http://dx.doi.org/10.1016/j.jsp.2005.06.001>. [80]

- Cryer, D. et al. (1999), “Predicting process quality from structural quality in preschool programs: A cross-country comparison”, *Early Childhood Research Quarterly*, Vol. 14/3, pp. 339-361, [http://dx.doi.org/10.1016/S0885-2006\(99\)00017-4](http://dx.doi.org/10.1016/S0885-2006(99)00017-4). [26]
- de Haan, A. et al. (2013), “Targeted versus mixed preschools and kindergartens: Effects of class composition and teacher-managed activities on disadvantaged children's emergent academic skills”, *School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice*, Vol. 24/2, pp. 177-194, <http://dx.doi.org/10.1080/09243453.2012.749792>. [71]
- Deynoot-Schaub, M. and J. Riksen-Walraven (2005), “Child care under pressure: The quality of Dutch centers in 1995 and in 2001”, *The Journal of Genetic Psychology: Research and Theory on Human Development*, Vol. 166/3, pp. 280-296, <http://dx.doi.org/10.3200/GNTP.166.3.280-296>. [12]
- Doherty, G. et al. (2006), “Predictors of quality in family child care”, *Early Childhood Research Quarterly*, Vol. 21/3, pp. 296-312, <http://dx.doi.org/10.1016/j.ecresq.2006.07.006>. [40]
- Early, D. et al. (2006), “Are teachers’ education, major, and credentials related to classroom quality and children’s academic gains in pre-kindergarten?”, *Early Childhood Research Quarterly*, Vol. 21/2, pp. 174-195, <http://dx.doi.org/10.1111/j.1467-8624.2007.01014.x>. [38]
- Ebert, S. et al. (2013), “Internal and external influences on vocabulary development in preschool children”, *School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice*, Vol. 24/2, pp. 138-154, <http://dx.doi.org/10.1080/09243453.2012.749791>. [70]
- Egert, F. (2015), *Meta-analysis on the impact of in-service professionals development programs for preschool teachers on quality ratings and child outcomes*, doctoral dissertation, Bamberg, Germany. [52]
- Fukkink, R. and A. Lont (2007), “Does training matter? A meta-analysis and review of caregiver training studies”, *Early Childhood Research Quarterly*, Vol. 22, pp. 294-311, <http://dx.doi.org/10.1016/j.ecresq.2007.04.005>. [44]
- Fuligni, A. et al. (2009), “Diverse pathways in early childhood professional development: An exploration of early educators in public preschools, private preschools, and family child care homes”, *Early Education and Development*, Vol. 20/3, pp. 507-526, <http://dx.doi.org/10.1080/10409280902783483>. [82]
- Guo, Y. et al. (2010), “Relations among preschool teachers’ self-efficacy, classroom quality, and children’s language and literacy gains”, *Teacher and Teacher Education*, Vol. 26/4, pp. 1094-1103, <http://dx.doi.org/10.1016/j.tate.2009.11.005>. [27]

- Hallam, R., K. Bargreen and R. Ridgley (2013), “Quality in family child care settings: The relationship between provider educational experiences and global quality scores in a statewide quality rating and improvement system”, *Journal of Research in Childhood Education*, Vol. 27/4, pp. 393-406, <http://dx.doi.org/10.1080/02568543.2013.822950>. [56]
- Hamre, B. et al. (2012), “A course on effective teacher-child interactions: Effects on teacher beliefs, knowledge, and observed practice”, *American Educational Research Journal*, Vol. 49/1, pp. 88-123, <http://dx.doi.org/10.3102/0002831211434596>. [45]
- Ho, D., M. Lee and Y. Teng (2016), “Size matters: The link between staff size and perceived organizational support in early childhood education”, *International Journal of Educational Management*, Vol. 30/6, pp. 1104-1122, <http://dx.doi.org/10.1108/IJEM-09-2015-0125>. [24]
- Howes, C. (1997), “Children's experiences in center-based child care as a function of teacher background and adult:child ratio.”, *Merrill-Palmer Quarterly*, Vol. 43, pp. 404-425. [21]
- Howes, C. et al. (2008), “Ready to learn? Children’s pre-academic achievement in pre-Kindergarten programs”, *Early Childhood Research Quarterly*, Vol. 23/1, pp. 27-50, <http://dx.doi.org/10.1016/j.ecresq.2007.05.002>. [7]
- Hu, B. et al. (2016a), “Predictors of Chinese early childhood program quality: Implications for policies”, *Children and Youth Services Review*, Vol. 70, pp. 152-162, <http://dx.doi.org/10.1016/j.childyouth.2016.09.013>. [2]
- Hulpia, H. et al. (2016), *MeMoQ Deelrapport 10. Emotionele en educatieve ondersteuning in de nulmeting*, Kind en Gezin, Ugent, KU Leuven. [13]
- Jamison, K. et al. (2014), “CLASS-Infant: An observational measure for assessing teacher-infant interactions in center-based child care”, *Early Education and Development*, Vol. 25/4, pp. 553-572, <http://dx.doi.org/10.1080/10409289.2013.822239>. [14]
- Jennings, P. (2015), “Early childhood teachers’ well-being, mindfulness, and self-compassion in relation to classroom quality and attitudes towards challenging students”, *Mindfulness*, Vol. 6/4, pp. 732-743, <http://dx.doi.org/10.1007/s12671-014-0312-4>. [57]
- Jensen, P. and A. Rasmussen (2015), *Does Professional Development of Preschool Teachers Improve Child Socio-Emotional Outcomes?*, IZA Discussion Paper No. 8957. [53]
- Jeon, L., C. Buettner and E. Hur (2014), “Examining pre-school classroom quality in a statewide quality rating and improvement system”, *Child & Youth Care Forum*, Vol. 43/4, pp. 469-487, <http://dx.doi.org/10.1007/s10566-014-9248-z>. [74]
- Justice, L. et al. (2008), “Quality of language and literacy instruction in preschool classrooms serving at-risk pupils”, *Early Childhood Research Quarterly*, Vol. 23/1, pp. 51-68, <http://dx.doi.org/10.1016/j.ecresq.2007.09.004>. [46]

- King, E. et al. (2016), “Classroom quality in infant and toddler classrooms: impact of age and programme type”, *Early Child Development and Care*, Vol. 186/11, pp. 1821-1835, <http://dx.doi.org/10.1080/03004430.2015.1134521>. [35]
- Kuger, S. et al. (2015), “Stability and patterns of classroom quality in German early childhood education and care”, *An International Journal of Research, Policy, and Practice*, Vol. 27/3, pp. 418-440, <http://dx.doi.org/10.1080/09243453.2015.1112815>. [65]
- Lahti, M. et al. (2015), “Approaches to validating child care quality rating and improvement systems (QRIS): Results from two states with similar QRIS type”, *Early Childhood Research Quarterly*, Vol. 30, pp. 280-290, <http://dx.doi.org/10.1016/j.ecresq.2014.04.005>. [75]
- Lehrl, S., S. Kuger and Y. Anders (2014), “Soziale disparitäten beim zugang zu kindergartenqualität und differenzielle konsequenzen für die vorschulische mathematische entwicklung (Social disparities in access to preschool quality and differential consequences on the development of early numeracy)”, *Unterrichtswissenschaft*, Vol. 42, pp. 132-151. [67]
- Leu, H. and R. Schelle (2009), “Between education and care? Critical reflections on early childhood policies in Germany”, *Early Years*, Vol. 29/1, pp. 5-18, <http://dx.doi.org/10.1080/09575140802689034>. [66]
- Lipscomb, S. et al. (2017), *Oregon’s quality rating improvement system (QRIS) validation study one: Associations with observed program quality*, Portland State University and Oregon State University. [76]
- LoCassale-Crouch, J. et al. (2007), “Observed classroom quality profiles in state-funded pre-kindergarten programs and associations with teacher, program, and classroom characteristics”, *Early Childhood Research Quarterly*, Vol. 22/1, pp. 3-17, <http://dx.doi.org/10.1016/j.ecresq.2006.05.001>. [68]
- LoCassale-Crouch, J. et al. (2011), “Implementing an early childhood professional development course across 10 sites and 15 sections: Lessons learned”, *NHSA Dialog: A Research-to-Practice Journal for the Early Childhood Field*, Vol. 14/4, pp. 275-292, <http://dx.doi.org/10.1080/15240754.2011.617527>. [47]
- Markussen-Brown, J. et al. (2017), “The effects of language- and literacy focused professional development on early educators and children: A best-evidence meta-analysis”, *Early Childhood Research Quarterly*, Vol. 38, pp. 97-115, <http://dx.doi.org/10.1016/j.ecresq.2016.07.002>. [54]
- Mashburn, A. et al. (2008), “Measures of classroom quality in prekindergarten and children’s development of academic, language, and social skills”, *Child Development*, Vol. 79/3, pp. 732-749, <http://dx.doi.org/10.1111/j.1467-8624.2008.01154.x>. [3]
- Mashburn, A. et al. (2009), “Peer effects on children’s language achievement during pre-kindergarten”, *Child Development*, Vol. 80/3, pp. 686-702, <http://dx.doi.org/10.1111/j.1467-8624.2009.01291.x>. [8]

- Montie, J., Z. Xiang and L. Schweinhart (2006), “Preschool experience in 10 countries: Cognitive and language performance at age 7”, *Early Childhood Research Quarterly*, Vol. 21/3, pp. 313-331, <http://dx.doi.org/10.1016/j.ecresq.2006.07.007>. [9]
- Moon, J. and J. Burbank (2004), “The Early Childhood Education Career and Wage Ladder: A Model for Improving Quality in Early Learning and Care Programs”, <http://www.eoionline.org> (accessed on 02 February 2018). [62]
- NICHD Early Child Care Research Network (2002), “Child-care structure → process → outcome: Direct and indirect effects of child-care quality on young children’s development”, *Psychological Science*, Vol. 13/3, pp. 199-206, <http://dx.doi.org/10.1111/1467-9280.00438>. [23]
- OECD (2011), *Starting strong III: A Quality Toolbox for Early Childhood Education and Care*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264123564-en>. [85]
- OECD (2015), *Starting Strong IV: Monitoring Quality in Early Childhood Education and Care*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264233515-en>. [77]
- Pessanha, M., C. Aguiar and J. Bairrão (2007), “Influence of structural features on Portuguese toddler child care quality”, *Early Childhood Research Quarterly*, Vol. 22, pp. 204-214, <http://dx.doi.org/10.1016/j.ecresq.2007.02.003>. [16]
- Philips, D. et al. (2000), “Within and beyond the classroom door: Assessing quality in child care centers”, *Early Childhood Research Quarterly*, Vol. 15/4, pp. 475-496, [http://dx.doi.org/10.1016/S0885-2006\(01\)00077-1](http://dx.doi.org/10.1016/S0885-2006(01)00077-1). [4]
- Phillipsen, L. et al. (1997), “The prediction of process quality from structural features of child care”, *Early Childhood Research Quarterly*, Vol. 12, pp. 281-303, [http://dx.doi.org/10.1016/S0885-2006\(97\)90004-1](http://dx.doi.org/10.1016/S0885-2006(97)90004-1). [5]
- Pianta, R. et al. (2005), “Features of Pre-Kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions?”, *Applied Developmental Science*, Vol. 9/3, pp. 144-159. [28]
- Raikes, H., H. Raikes and B. Wilcox (2005), “Regulation, subsidy receipt and provide characteristics: What predicts quality in child care homes?”, *Early Childhood Research Quarterly*, Vol. 20/2, pp. 164-184, <http://dx.doi.org/10.1016/j.ecresq.2005.04.006>. [41]
- Silva et al. (ed.) (2010), *The EPPE Research Design: an educational effectiveness focus*, Routledge, London/New York. [64]
- Schaack, D., V. Le and C. Setodji (2017), “Home-based child care provider education and specialized training: Associations with caregiving quality and toddler social-emotional and cognitive outcomes”, *Early Education and Development*, Vol. 28/6, pp. 655-668, <http://dx.doi.org/10.1080/10409289.2017.1321927>. [42]
- Schnechter, C. and B. Bye (2007), “Preliminary evidence for the impact of mixed-income preschools on low-income children's language growth”, *Early Childhood Research Quarterly*, Vol. 22/1, pp. 137-146, <http://dx.doi.org/10.1016/j.ecresq.2006.11.005>. [72]

- Siraj-Blatchford, I. et al. (2005), “Technical Paper 10 "Intensive Case Studies of Practice Across Foundation Stage"", <http://www.leeds.ac.uk/educol/documents/00003934.htm> (accessed on 19 February 2018). [50]
- Slot, P. et al. (2015), “Associations between structural quality aspects and process quality in Dutch early childhood education and care settings”, *Early Childhood Research Quarterly*, Vol. 33, pp. 64-76, <http://dx.doi.org/10.1016/j.ecresq.2015.06.001>. [36]
- Slot, P., M. Lerkkanen and P. Leseman (2015), *The relations between structural quality and process quality in European early childhood education and care provisions: Secondary data analyses of large scale studies in five countries*, CARE, [http://ecec-care.org/fileadmin/careproject/Publications/reports/CARE\\_WP2\\_D2\\_2\\_Secondary\\_data\\_analyses.pdf](http://ecec-care.org/fileadmin/careproject/Publications/reports/CARE_WP2_D2_2_Secondary_data_analyses.pdf). [48]
- Slot, P. et al. (2016), *D2.3: Multiple case study in seven European countries regarding culture-sensitive classroom quality assessment*, CARE, [http://ecec-care.org/fileadmin/careproject/Publications/reports/CARE\\_WP2\\_D2\\_3\\_Multiple\\_Case\\_study\\_FINAL\\_REPORT.pdf](http://ecec-care.org/fileadmin/careproject/Publications/reports/CARE_WP2_D2_3_Multiple_Case_study_FINAL_REPORT.pdf). [84]
- Slot, P. (2016), *Curriculum voor het jonge kind (Curriculum for young children)*, uitgave Kennisdossier kinderopvang BKK Oktober 2016, [https://www.ris.uu.nl/ws/files/26172779/Kennisdossier\\_BKK\\_201601\\_prf02\\_PS.pdf](https://www.ris.uu.nl/ws/files/26172779/Kennisdossier_BKK_201601_prf02_PS.pdf). [86]
- Slot, P. (2017), *Literature review on Early Childhood Education and Care quality: Relations between structural characteristics at different levels and process quality*, Internal document, OECD, Paris. [78]
- Slot, P. et al. (2017a), “Measurement properties of the CLASS Toddler in ECEC in the Netherlands”, *Journal of Applied Developmental Psychology*, Vol. 48, pp. 79-91, <http://dx.doi.org/10.1016/j.appdev.2016.11.008>. [73]
- Slot, P. et al. (2017b), *Structural and Process Quality of Danish Preschools: Direct and Indirect Associations with Children’s Growth in Language and Pre-Literacy Skills*, Revision submitted for publication. [29]
- Sylva, K. et al. (2004), *The Effective Provision of Pre-school Education (EPPE) project: Final Report - A longitudinal study funded by the DfES 1997-2004*, Institute of Education, University of London/ Department for Education and Skills/ Sure Start, London. [32]
- Thomason, A. and K. La Paro (2009), “Measuring the quality of teacher–child interactions in toddler child care”, *Early Education and Development*, Vol. 20, pp. 285-304, <http://dx.doi.org/10.1080/10409280902773351>. [15]
- Tonyan, H. and C. Howes (2003), “Exploring patterns in time children spend in a variety of child care activities: Associations with environmental quality, ethnicity, and gender”, *Early Childhood Research Quarterly*, Vol. 18/1, pp. 121-142, [http://dx.doi.org/10.1016/S0885-2006\(03\)00006-1](http://dx.doi.org/10.1016/S0885-2006(03)00006-1). [69]
- Vandenbroeck, M. et al. (2018), *Quality in family child care providers: A study of variations in process quality of home-based childcare*, Submitted for publication in European Early Childhood Education Journal. [43]

- Vermeer, H. et al. (2016), “Quality of child care using the environmental rating scales: A meta-analysis of international studies”, *International Journal of Early Childhood*, Vol. 48/1, pp. 33-60, <http://dx.doi.org/10.1007/s13158-015-0154-9>. [6]
- Vogel, C. et al. (2015a), *Toddlers in early Head Start: A portrait of 2-years-olds, their families, and the program serving them*, Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, Washington, DC. [17]
- Vogel, C. et al. (2015b), *Toddlers in early Head Start: A portrait of 3-years-olds, their families, and the program serving them*, Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, Washington, DC. [18]
- von Suchodoletz, A. et al. (2017), “Associations among quality indicators in early childhood education and care (ECEC) and relations with child development and learning: A meta-analysis”, Internal document, OECD, Paris. [37]
- Zaslow, M. et al. (2004), “The role of professional development in creating high quality preschool education”, *Welfare Reform & Beyond Working Paper*, <https://www.brookings.edu/wp-content/uploads/2016/06/200411Zaslow.pdf> (accessed on 19 February 2018). [51]
- Zaslow, M. and I. Martinex-Beck (eds.) (2006), *Quality and qualifications: Links between professional development and quality in early care and education settings*, Brookes Publishing, Baltimore. [30]
- Zaslow, M. et al. (2010), *Quality, dosage, thresholds, and features in early childhood settings: A review of the literature*, Mathematica Policy Research, Washington, DC. [49]



**From:**

## **Engaging Young Children**

### **Lessons from Research about Quality in Early Childhood Education and Care**

**Access the complete publication at:**

<https://doi.org/10.1787/9789264085145-en>

#### **Please cite this chapter as:**

OECD (2018), “Key insights and avenues for further research”, in *Engaging Young Children: Lessons from Research about Quality in Early Childhood Education and Care*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264085145-8-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to [rights@oecd.org](mailto:rights@oecd.org). Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at [info@copyright.com](mailto:info@copyright.com) or the Centre français d'exploitation du droit de copie (CFC) at [contact@cfcopies.com](mailto:contact@cfcopies.com).